EPARTMENT OF TRANSPORTATION

Research and Special Programs Administration

49 CFR Part 173

[Docket No. HM-166P; Amdt. No. 173-193]

Hazardous Materials; Radiation Level Limits for Exclusive Use Shipments of Radioactive Materials

AGENCY: Materials Transportation Bureau (MTB), Research and Special Programs Administration, DOT.

ACTION: Final rule.

SUMMARY: The purpose of this final rule is to amend the Hazardous Materials Regulations (HMR) to more clearly and completely specify external radiation level limitations for exclusive use shipments of radioactive materials and to specify the necessary capabilities for personnel who load and unload exclusive use shipments of radioactive materials. The changes are necessary to reduce misunderstandings of regulatory requirements and are intended to foster compliance with these requirements and to help ensure adequate radiation protection for personnel who load and nload shipments.

EFFECTIVE DATE: December 1, 1985.

FOR FURTHER INFORMATION CONTACT: R.R. Rawl, Office of Hazardous Materials Regulation Materials Transportation Bureau, U.S. Department of Transportation, 400 Seventh Street SW., Washington, DC 20590, telephone (202) 426-2313.

SUPPLEMENTARY INFORMATION:

I. Background

On October 7, 1982, the MTB published a notice (Docket HM-166P, Notice No. 82-8) in the **Federal Register** (47 FR 44356) proposing certain amendments to the HMR, specifically, to 49 CFR 173.389(o) and 173.393(j). The proposed amendments were designed to:

(A) Clarify the qualifications required of a "designated agent" when used for exclusive use shipments of radioactive material, as required by § 173.389(o)(2).

(B) Require reasonable efforts by shippers toward bringing each package into conformance with the lower radiation level limits specified in § 173.393(i).

(C) Reduce the maximum permitted radiation level for packages from 1,000 millirem per hour (mrem/h) or 10 millisieverts per hour (mSv/h) at 3 feet from the package surface to 1,000 mrem/h) (10 mSv/h at the package surface.

(D) Clarify that the 200 mrem/h (2 mSv/h) limit of § 173.393(j)(2) applies to readily accessible surfaces of the vehicle or load.

(E) Clarify that the 10 mrem/h (0.1 mSv/h) at 2 meters limit of § 173.393(j)(3) applies from readily accessible surfaces (except top and bottom).

(F) Specify that private carriers excepted from the 2 mrem/h (0.02 mSv/h) limit in occupied areas (§ 173.393(j)(2)(iii)) must have their personnel under a State or Federally regulated radiation protection program.

(G) Specify that the exclusive use instructions required by § 173.393(j) must be sufficient to assure that the carrier avoids unnecessary delay and any actions that would increase radiation levels or exposures.

Discussion of the reasoning for each proposed change was given in the proposal.

The final rules contained in Docket HM-169 were published (48 FR 10218, March 10, 1983; 48 FR 13431, March 1983 and 48 FR 31214, July 7, 1983) subsequent to the proposals of this docket. Some of the rule changes made by HM-169 have direct bearing on this docket. It was foreseen in HM-169 that this would occur and those overlapping requirements have been meshed as best possible. HM-169 did, however, finalize some of the proposals contained in the notice of proposed rulemaking for this docket. For example, the reduction of the maximum radiation level allowed for a package (item C above) was finalized by HM-169 in § 173.441(b)(1).

HM-169 restructured and renumbered all of the radioactive materials transport requirements. In order to assist the reader in reviewing these changes, the following cross references are provided:

49 CFR prior to July 1, 1983	Proposed in HM-166P	New section notation as of July 1, 1983 (per HM-169)
173.389(o)(2)	173.389(o)(2)	173.403(l).
173.393(i)	No change	173.441(a).
173.393(j)	173.393(j) and 173.393(j)(3).	173.441(b), (c), and (e).
173.393(j)(1)	173.393(j)(1)	173.441(b)(1).
173.393(j)(2)	173.393(j)(2)(i)	173.441(b)(2).
173.393(j)(2)	173.393(j)(2)(ii)	173.441(b)(3).
173.393(j)(4)	173.393(j)(2)(iii)	173.441(b)(4)

In the regulations established by HM-169, there are three additional requirements placed on the shipment of a package with radiation levels exceeding 200 mrem/h(2 mSv/h) at the surface or 10 mrem/h(0.1 mSv/h) at one meter. They are found in § 173.441(b)(1) and specify that the package must be shipped in a closed transport vehicle as defined in § 173.403(c), the package mus remain in a fixed location within the vehicle, and there must be no loading or unloading operations during the transport.

In this final rule, changes are made to the requirements as they now appear in § 173.441 and not § 173.393 as proposed. Interested readers are referred to the final rules published in Docket HM-169 for additional background information.

II. Comments and Changes to the Proposal

Comments were received from 12 commenters and all favored adoption of the overall proposal while making recommendations about specific provisions within the proposal. The comments have been grouped according to the proposed changes as listed above.

A. Designated Agent (Proposed § 173.389(o)(2); Now Germane to § 173.403(l))

One commenter fully supported the proposed requirement. Another commenter agreed with the need for proper training and resources for a designated agent but questioned if this is necessary for a carrier who does not handle, load or unload the cargo. It is MTB's intent to require such training and resources *only* when in-transit loading and unloading takes place. Exclusive use shipments which do not involve in-transit loading or unloading do not require the use of a carrier with personnel having such training. Any in-transit handling or shifting of the cargo, however, including actions such as adjusting a load for with purposes *will* require proper training and resources on the part of the personnel doing such work.

The term "designated agent" has apparently created some confusion with the common usage of the term in the transportation industry. HM-169 eliminated the provision for loading and unloading operations under the direction of a designated agent. The consignor and consignee have direct knowledge of the nature of the cargo and are in the best position to direct any loading or unloading operations of an exclusive use shipment. Since the term "designated agent" is not necessary to implement the intent of the proposed requirement, it remains deleted per HM-169. A combination of the definition of exclusive use adopted under HM-169 and that proposed in Notice 82-8 is adopted. Initial, intermediate and final loading and unloading must be performed under the direction of the consignor or consignee by persons having appropriate radiological training and resources for safe handling of the consignment. An exclusive use shipment

which does not involve carrier personnel in loading or unloading operations does not require that carrier personnel be specifically trained in procedures for handling the consignment. The responsibility for ensuring that appropriately trained personnel are used rests with the consignor or consignee, depending on whose directions are being followed. Appropriate training could either be supplied by the consignor or consignee, or could be provided by the employer providing the services of the personnel performing the loading or unloading.

B. Require Reasonable Efforts To Conform With the Lower Radiation Level Limitations of § 173.441(a) Before the Higher Limits of § 173.441(b) Are Utilized (Now Germane to §§ 173.441 (a) and (b))

Three comments were received concerning this point. Each questioned the extent of efforts which package designers must expend to comply with the lower radiation level limits (§ 173.441(a)) before the higher limits (§ 173.441(b)) may be utilized. It is basically a question of what constitutes "reasonable" and the concern of the commenters was that many different levels of "reasonable" effort can be imagined. In actual application this requirement would be quite onerous.

The primary purpose for the proposed requirement was to avoid any unnecessary radiation exposure to personnel handling packages. The new definition of exclusive use, § 173.403(i), now requires all loading and unloading of exclusive use shipments to be performed by trained personnel. Since a package with radiation levels exceeding the limits of § 173.441(a) must conform with § 173.441(b), it must be shipped as exclusive use. Consequently, packages with radiation levels exceeding 200 mrem/h (2 mSv/h) at the surface or 10 mrem/h (0.1 mSv/h) at one meter may be loaded and unloaded only by trained personnel. Additionally, § 173.441(b)(1)(iii) prohibits in-transit handling of high surface radiation level packages. Therefore, MTB believes that the primary intent of the proposed requirement will be met without incorporating a reference to "reasonable efforts and accepted radiation protection practices" and that proposal is withdrawn.

C. Reduce the Maximum Allowable Radiation Level of a Package From 1000 mrem/ (10 mSv/h) at 3 feet to 1000 mrem/h(10 mSv/h) at the Package Surface (Now Germane to § 173.441(b)(1))

This requirement was originally proposed, addressed, and incorporated under HM-169.

D. Specify That the 200 mrem/h (2 mSv/h) Vehicle Radiation Level Limit Applies To All Readily Accessible External Surfaces (Now Germane to § 173.441(b)(2))

Five commenters addressed this proposed requirement.

Two commenters requested assurance that the 200 mrem/h (2 mSv/h) limit still applies to the top and underside of the vehicle. It is MTB's intent to continue the application of this limit to the top and underside of vehicles and in order to clarify this the term "including the top and underside of the vehicle or load" is used. Application of the limit to the top of the load is limited to open transport vehicles, whereas closed vehicles have the limit applied at the vehicle enclosure.

Two commenters addressed the proposed requirement which specifies the 200 mrem/h (2 mSv/h) at "accessible surfaces" when it is applied to flat-bed style vehicles. This issue arises from the International Atomic Energy Agency (IAEA) approach (adopted in HM-169) of specifying the 200 mrem/h (2 mSv/h) limit at the outer surface of the vehicle or at the base of an "open" vehicle at the vertical planes projected by the outer edges of the vehicle. Under the IAEA and HM-169 approach, a flat-bed trailer in exclusive use can be used to transport a package with a surface dose rate over 200 mrem/h (2 mSv/h) but not exceeding 1000 mrem/h (10 mSv/h) provided that the vehicle is equipped with an enclosure which limits access to the cargo area, the cargo is secured so that its location remains fixed, and there is no in-transit loading and unloading.

The main difference between the IAEA approach and the "accessible surfaces" approach is that for the former, no radiation level limit is specified at the enclosure. When the enclosure covers only part of the vehicle bed (the cargo space), the radiation levels at the enclosure could exceed 200 mrem/h (2 mSv/h) but will still be constrained to the limits at the edges of the vehicle.

One commenter objected to MTB's proposed deviation from the IAEA approach and one commenter supported MTB's proposal. The difference of opinion arises from the philosophies underlying the two approaches. In the latter (specifying limits at the enclosure), it is assured that there will be a limit at any surface which may be contacted even under unusual circumstances (such as someone climbing onto the vehicle). In the case of specifying the limit at the edges of the vehicle, (per IAEA and HM-169), the vehicle itself has the limits applied to it. The vehicle basically represents a "package" and the 200 mrem/h (2 mSv/h) limits apply to its perimeter. Under all normal situations the approaches are basically equal, such as when evaluating exposures to surrounding populations, passengers in other vehicles and people present at rest and refueling stops. Only in the extreme situation of persons remaining on the vehicle for a significant period of time would the "accessible surfaces" approach provide appreciable dose reduction over the "outer edges" approach. The commenter opposing MTB's proposal believed that the additional protection afforded to persons who are not authorized to be on the vehicle was insufficient to justify deviating from the present U.S. and international requirements.

MTB has also taken into consideration the potential threat to inspection personnel who may be checking the vehicle for compliance with radiation level limits. If the limits are specified at the enclosure, inspectors must either climb onto the vehicle or use extendable radiation detection probes. It is desirable for inspectors to minimize their exposure by using extendable probes but some instruments currently in use cannot be modified to accomplish this. Additionally, inspectors are often required to perform in less than ideal situations such as poor weather or darkness where the physical act of climbing on a trailer entails some element of risk. From these standpoints, it is better to prescribe the radiation limits at the edges of the vehicle.

The MTB believes that the small hypothetical dose reduction which might result from using the proposed "accessible surfaces" limits are outweighed by the small but real increase in risk to inspection personnel. Additionally, by keeping the existing "outer edges" limits, MTB will avoid imposing additional costs on the shipping industry and will maintain the closest practical alignment with the IAEA regulations. Therefore, § 173.441(b) (2) and (3) are not amended as originally proposed. Instead, they are amended to clarify that the radiation limits applicable to flat-bed style vehicles apply at the outer edges of the vehicle. Such vehicles must have suitable enclosures when used in accordance with § 173.441(b)(1) which allows for the transportation of packages with surface radiation levels exceeding 200 mrem/h (2 mSv/h). Even when enclosures are required, however, the vehicle radiation level limit of 200 mrem/h (2 mSv/h) is applied at the outer edges of a flat-bed vehicle.

E. Specify That the 10 mrem/h (0.1 mSv/h) at 2 Meters Vehicle Radiation Level

Limit Applies From Readily Accessible Surfaces, Except Top and Bottom (Now Germane to § 173.441(b)(3))

The proposal was to specify the 10 mrem/h (0.1 mSv/h) limit at 2 meters from the external surfaces as opposed to specifying it from the walls of a closed vehicle and from the vertical planes projected from the outer edges of a flat-bed style vehicle.

The comments received on this point were very similar to those discussed above under item D. MTB's line of reasoning is similar also. Therefore, § 173.441(b)(3) is amended only to clarify its application, particularly with regard to flat-bed style vehicles.

F. Clarify That Private Carriers Excepted From the 2 mrem/h (0.02 mSv/h) Limit in Occupied Areas Must Have Their Personnel Under a State or Federally Regulated Radiation Protection Program (Now Germane to § 173.41a(b)(4))

One commenter addressed this proposal and suggested that MTB reconsider the exception for private carriers. The commenter cited examples of poor radiation protection practices which some private carriers have indulged.

MTB believes that by requiring private carrier personnel to operate under a regulated radiation protection program such poor practices can be discovered and corrected. Of course, private carriers may still choose to operate in compliance with the 2 mrem/h (0.02 mSv/h) limit in occupied areas and thus avoid the requirement for a State or Federally regulated radiation safety program. Therefore, instead of completely eliminating the exception for private carriers, (which was not originally proposed) MTB believes that adoption of the requirement, as proposed, will improve the situation.

The commenter also requested that MTB clarify the definition of a private carrier. The term is defined in 49 CFR 390.33(b) and its usage in § 173.441(b)(4) is consistent with this definition.

Clarification was also sought as to whether or not the 2 mrem/h (0.02 mSv/h) limit (for carrier operations not excepted) applies in the sleeper compartments of tractor/trailer combinations. MTB's interpretation of this requirement is that the limit does apply to all spaces which can be regularly occupied. This includes sleeper compartments unless specific actions are taken to prevent the occupation of these areas.

G. Specify That the Exclusive Use Instructions Issued by the Shipper Must be Sufficient to Assure That the Carrier Avoids Unnecessary Delay and Any Action That Would Increase Radiation Levels or Exposures (Now Germane to § 173.441(e))

Two commenters addressed this proposal and both were concerned with the requirement that the shipper *assure* that the carrier not take any adverse action. MTB realizes that the actual actions of the carrier are beyond the absolute control of the shipper. However, the specific instructions provided by the shipper need to be complete enough so that when the carrier follows them, there will be no unnecessary delay or increase in radiation levels or exposures.

There have been instances where carrier personnel have taken actions such as load shifting or power unit substitution which have resulted in unnecessary radiation exposure. In other cases, the delivery of the consignment has been delayed for the carrier's convenience and this may lead to unnecessary exposures as well. MTB believes that it is necessary for the shipper to be specific in the instructions to preclude, as far as possible, these occurrences. If the shipper issues specific instructions and the carrier fails to follow them, it is clearly not a situation the shipper could control. On the other hand, if the instructions are not clear or complete, the carrier's actions may be in conformance with them and yet result in unnecessary delay or increased radiation levels or exposure. This would be an example of the shipper failing to fulfill the requirement. MTB believes the existing § 173.441(e), as promulgated under Docket HM-169, adequately states this requirement and no changes are made to it in this final rule.

III. Administrative Notices

A. Executive Order 11129

The MTB has determined that the effect of this final rule will not meet the criteria specified in section 1(b) of Executive Order 12291 and the final rule is, therefore, not a major rule. This is not significant rule under DOT regulatory procedures (44 FR 11034) and requires neither a Regulatory Impact Analysis, nor an environmental impact statement under the National Environmental Policy Act (49 U.S.C. 4321 et seq.) A regulatory evaluation is available for review in the Docket.

B. Impact on Small Entities

Based on limited information concerning size and nature of entities likely affected, I certify this final rule will not, as promulgated, have a significant economic impact on a substantial number of small entities under criteria of the Regulatory Flexibility Act.

List of Subjects in 49 CFR Part 173

Hazardous materials transportation.

In consideration of the foregoing, Part 173 of Title 49, Code of Federal Regulations is amended as follows:

PART 173—SHIPPERS—GENERAL REQUIREMENTS FOR SHIPMENTS AND PACKAGINGS

1. The authority citation for Part 173 continues to read as follows:

Authority: 49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, unless otherwise noted.

2. In § 173.403, paragraph (i) is amended by adding a new sentence at the end of the first sentence and preceding the last sentence of the paragraph, to read as follows:

§ 173.403 Definitions.

* * * * *

(i) * * * Any loading or unloading must be performed by personnel having radiological training and resources appropriate for safe handling of the consignment. * * *

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3. In § 173.441, paragraph (b) is revised to read as follows:

§ 173.441 Radiation level limitations.

* * * * *

(b) A package which exceeds the radiation level limits specified in paragraph (a) of this section shall be transported by exclusive use shipment only and the radiation levels for such shipment must not exceed the following during transportation:

(1) 200 millirem per hour (2 millisievert per hour) on the external surface of the package unless the following conditions are met, in which case the limit is 1000 millirem per hour (10 millisievert per hour).

(i) The shipment is made in a closed transport vehicle;

(ii) The package is secured within the vehicle so that its position remains fixed during transportation; and

(iii) There are no loading or unloading operations between the beginning and end of the transportation;

(2) 200 millirem per hour (2 millisievert per hour) at any point on the outer surfaces of the vehicle, including the top and underside of the vehicle; or in the case of a flat-bed style vehicle, at any point on the vertical planes projected from the outer edges of the vehicle, on the upper surface of the load (or enclosure is used), and on the lower external surface of the vehicle;

(3) 10 millirem per hour (0.1 millisievert per hour) at any point 2 meters (6.6 feet) from the outer lateral surfaces of the vehicle (excluding the top and underside of the vehicle); or in

devices and operate under provisions of a State or Federally regulated radiation protection program.

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Issued in Washington, D.C. on Oct. 9, 1985 under the authority delegated in 49 CFR Part 1, Appendix A.

M. Cynthia Douglass,

Acting Director, Materials Transportation Bureau.

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